

Science Bowl Questions 1994

Round 14

Toss-Up

1. ERSC; Multiple Choice: The dominant relative movement of earth's crust along the San Andreas Fault can best be described:

a) normal
b) transform
c) reverse
d) oblique

ANSWER: B – TRANSFORM

Bonus

1. ERSC; Short Answer: To what geophysical events in earth history do the terms "Brunhes," "Matuyama," "Gauss," and "Gilbert" Epochs refer?

ANSWER: PERIODS OF PREDOMINANTLY ONE PALEOMAGNETIC POLARITY

Toss-Up

2. BIOL; Multiple Choice: Which stem structure contains immature leaves, an apical meristem and a series unelongated internodes:

a) stem node
b) stem internode
c) terminal bud
d) protoderm

ANSWER: C – TERMINAL BUD

Bonus

2. BIOL; Multiple Choice: New leaves called fiddleheads are characteristic of the:

a) horsetails
b) ferns
c) lycopsida
d) psilopsida

ANSWER: B – FERNS

Toss-Up

3. COMP; Short Answer: When programming in BASIC, what statement reinitializes the sequence of random numbers that are generated by RND function?

ANSWER: RANDOMIZE or RANDOMIZE [SEED]

Bonus

3. COMP; Short Answer: You are looking over a program written in BASIC and encounter the following statement:

INT(RND*10)-5 (read: I-N-T open parenthesis R-N-D star 10 close parenthesis minus 5)

You know system's random number generator produces values GREATER THAN 0 and LESS THAN 1. What range of values will the above statement produce?

ANSWER: -5 to +4

Toss-Up

4. PHYS; Multiple Choice: Compared to the heat of fusion, the heat of sublimation is:
- a) greater
 - b) less
 - c) equal
 - d) one half

ANSWER: A – GREATER

Bonus

4. PHYS; Multiple Choice: If the atmosphere were compressed until it had the density of water, it would have a depth of about:
- a) 0.81 km
 - b) 4.6 m
 - c) 76 cm
 - d) 10 m

ANSWER: D – 10 m

Toss-Up

5. GENR; Short Answer: In what year were pennies first made of steel instead of copper?

ANSWER: 1943

Bonus

5. GENR; Multiple Choice: Which of the following does not belong with the others?

- a) vanadium
- b) molybdenum
- c) tantalum
- d) technetium

ANSWER: D – TECHNETIUM (NO STABLE ISOTOPE OF TECHNICIUM EXISTS IN NATURE)

Toss-Up

6. CHEM; Short Answer: What are the two main elements in dental amalgam?

ANSWER: SILVER AND MERCURY

Bonus

6. CHEM; Multiple Choice: What crystal form makes up ordinary ice?

ANSWER: HEXAGONAL

Toss-Up

7. ASTR; Short Answer: On what date did man first land on the moon?

ANSWER: JULY 20,1969

Bonus

7. ASTR; Short Answer: How many Russians have landed on the moon?

ANSWER: ZERO

Toss-Up

8. BIOL; Multiple Choice: Taxonomists still use the basic classification system developed by:

- a) Hooke
- b) Darwin
- c) Linnaeus
- d) Wallace

ANSWER: C – LINNAEUS

Bonus

8. BIOL; Multiple Choice: Which group of plants was the most successful at colonizing terrestrial environments:

- a) Bryophyta
- b) Rhodophyta
- c) Phaeophyta
- d) Tracheophyta

ANSWER: D – TRACHEOPOHYTA

Toss-Up

9. MATH; Short Answer: The log of 50 to the base 3 is between what two consecutive integers?

ANSWER: 3 AND 4

Bonus

9. MATH; Multiple Choice: Two planes are perpendicular to each other. The locus of points at a distance D from one of these planes at a distance E from the other is:
- a) 2 points
 - b) 4 points
 - c) 2 lines
 - d) 4 lines

ANSWER: D – 4 LINES

Toss-Up

10. PHYS; Short Answer: Element X has a half-life of 12 hours. What fraction of X remains after 2 days?

ANSWER: 1/16 (ACCEPT 6.25% OR 0.0625)

Bonus

10. PHYS; Multiple Choice: Which of the following could not have units of Newtons per square meter?
- a) Young's modulus
 - b) shear modulus
 - c) strain
 - d) stress

ANSWER: C – STRAIN

Toss-Up

11. CHEM; Short Answer: The first plastic was a mixture of cellulose nitrate and camphor, invented in the 1860's by John Hyatt. What was the trademark given to this material?

ANSWER: CELLULOID

Bonus

11. CHEM; Short Answer: Used primarily in fertilizers, which element is never found free in nature, even though it makes up 2.4% of the earth's crust?

ANSWER: POTASSIUM

Toss-Up

12. COMP; Short Answer: What is the binary representation of the hexadecimal number C?

ANSWER: 1100 (read: 1 1 0 0)

Bonus

12. COMP; Multiple Choice: Who was the inventor of the tabulating machine which read data from punched cards and was used in the 1890 census?

- a) Thomas Edison
- b) Herman Hollerith
- c) Blaise Pascal
- d) John von Neumann

ANSWER: B – HERMAN HOLLERITH

Toss-Up

13. BIOL; Multiple Choice: During which stage of mitosis do the chromatids separate and become chromosomes?

- a) prophase
- b) metaphase
- c) anaphase
- d) telophase

ANSWER: C – ANAPHASE

Bonus

13. BIOL; Multiple Choice: Which of the following is not a layer of cells which forms during the embryonic development of animals?

- a) ectoderm
- b) endoderm
- c) basoderm
- d) mesoderm

ANSWER: C – BASODERM

Toss-Up

14. ASTR; Multiple Choice: The great red spot on the planet Jupiter is most analogous to what formation or condition on Earth?

- a) hurricane
- b) volcanic eruption
- c) crater
- d) desert

ANSWER: A – HURRICANE

Bonus

14. ASTR; Multiple Choice: Which of the following astronomical bodies is the largest that could possibly fit inside the diameter of Jupiter's red spot?

- a) Neptune
- b) Earth
- c) Earth's moon
- d) Mercury

ANSWER: B - EARTH

Toss-Up

15. PHYS; Short Answer: When tritium decays by beta decay, what nucleus is produced?

ANSWER: HELIUM – 3

Bonus

15. PHYS; Multiple Choice: A small sphere of wood with a specific gravity of 0.4 is held at rest well under the surface of a pool of water. The magnitude of the initial acceleration of the sphere when it is released is approximately:

- a) 15 meters/second squared
- b) 9.8 meters/second squared
- c) 33 meters/second squared
- d) 3.4 meters/second squared

ANSWER: A – 15 METERS/SECOND SQUARED

Toss-Up

16. CHEM; Short Answer: What is the first element discovered by Madame Curie which is named after her native country?

ANSWER: POLONIUM

Bonus

16. CHEM; Short Answer: What element was named after the Greek word for “hidden”?

ANSWER: KRYPTON

Toss-Up

17. ERSC; Multiple Choice: During which geological time period did the Order Rugosa (fossil corals) exist?

- a) Paleocene to Miocene
- b) Tertiary to Quaternary
- c) Pennsylvanian to Triassic
- d) Ordovician to Permian

ANSWER: D – ORDOVICIAN TO PERMIAN

Bonus

17. ERSC; Multiple Choice: The change in the gravitational acceleration on the earth's geoid is directly proportional to:

- a) latitude
- b) longitude
- c) tidal friction
- d) angular momentum

ANSWER: A – LATITUDE

Toss-Up

18. GENR; Short Answer: What is divided into sixty minutes besides the hour?

ANSWER: ONE DEGREE

Bonus

18. GENR; Short Answer: What element is named after the character in Greek mythology who stole fire from heaven and gave it to man?

ANSWER: PROMETHIUM (Pm) FOR PROMETHIUS

Toss-Up

19. PHYS; Multiple Choice: A coin is under water. From above the surface it appears to be:

- a) nearer the surface than it really is
- b) farther from the surface than it really is
- c) as deep as it really is
- d) none of the above

ANSWER: A – NEARER THE SURFACE THAN IT REALLY IS

Bonus

19. PHYS; Multiple Choice: A block of wood of relative density of 0.75 and dimensions 20.3 cm by 30.5 cm by 40.6 cm is tossed into a choppy freshwater lake. After a reasonable time, the approximate vertical dimension above the water will be:

- a) 2.54 cm
- b) 5.08 cm
- c) 7.62 cm
- d) 10.2 cm

ANSWER: B – 5.08 cm

Toss-Up

20. BIOL; Multiple Choice: the largest portion of our brain is the:

- a) medulla
- b) cerebellum
- c) cerebrum
- d) hypothalamus

ANSWER: C – CEREBRUM

Bonus

20. BIOL; Multiple Choice: The portion of the brain that bridges the nervous system to the endocrine system is the:

- a) hypothalamus
- b) medulla
- c) anterior pituitary
- d) posterior pituitary

ANSWER: A – HYPOTHALAMUS

Toss-Up

21. CHEM; Short Answer: Give the name of the compound formed by the addition of hydrogen chloride to isobutene.

ANSWER: TERTIARY-BUTYL CHLORIDE

Bonus

21. CHEM; Short Answer: What metal is present in a Grignard reagent?

ANSWER: MAGNESIUM

Toss-Up

22. PHYS; Multiple Choice: A beam of yellow light can be cut in half, and each half appears yellow. Can a photon in the yellow beam be “cut in half,” and if so, will it still appear yellow?

- a) It can be cut in half and yes, it would appear yellow
- b) It can be cut in half, but it would not appear yellow
- c) It cannot be cut in half, and even if it could, it would not appear yellow
- d) It cannot be cut in half, but if it could, it should appear yellow

ANSWER: C – IT CANNOT BE CUT IN HALF, AND EVEN IF IT COULD, IT WOULD NOT APPEAR YELLOW.

Bonus

22. PHYS; Multiple Choice: A rock is thrown into a swimming pool that is filled with water at a uniform temperature. Which of the following statements is true?

- a) the buoyant force on the rock is zero as it sinks
- b) the buoyant force on the rock increases as it sinks
- c) the buoyant force on the rock decreases as it sinks
- d) the buoyant force on the rock is constant as it sinks

ANSWER: D – THE BUOYANT FORCE ON THE ROCK IS CONSTANT AS IT SINKS

Toss-Up

23. MATH; Multiple Choice: A man usually gets from one corner of a square lot to the opposite corner by walking along two of the sides. Approximately what percent of the distance does he save if he walks along the diagonal?

- a) 25%
- b) 29%
- c) 33%
- d) 37%

ANSWER: B – 29%

Bonus

23. MATH; Short Answer: If $\log R$, plus $\log R$ squared, equals $\log 64$, R equals:

ANSWER: 4

Toss-Up

24. BIOL; Multiple Choice: Humans are in the phylum:

- a) Arthropoda
- b) Chordata
- c) Mammalia
- d) Animalia

ANSWER: B - CHORDATA

Bonus

24. BIOL; Multiple Choice: Which of the following is not a type of chromosomal mutation:

- a) translocation
- b) duplication
- c) conjugation
- d) inversion

ANSWER: C - CONJUGATION

Toss-Up

25. CHEM; Short Answer: What is the name of the polysaccharide that forms the hard shell of crustaceans and insects such as roaches?

ANSWER: CHITIN

Bonus

25. CHEM; Short Answer: A chemical may have both desirable and undesirable effects, depending on the circumstances. What chemical, considered a pollutant in air, is used as a preservative and a bleaching agent for foods?

ANSWER: SULFUR DIOXIDE
